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10/053,373	10/24/2001	Jeffrey T. Fanton	TWI-13310	2873

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EXAMINER

KIKNADZE, IRAKLI

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 07/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/053,373

Applicant(s)

FANTON ET AL.

Examiner

Irakli Kiknadze

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☒ Claim(s) 22,32 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

**DETAILED ACTION**

***Claim Objections***

1. Claim 22, 32 and 33 are objected to because of the following informalities:

Claim 22 recites the limitation " the thin film sample " in line 5.

Claim 32 recites the limitation " the take-off angle " in lines 1 and 2.

Claim 33 recites the limitation " the apparent width " in lines 1 and 2.

There are insufficient antecedent basis for this limitation in the claims.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

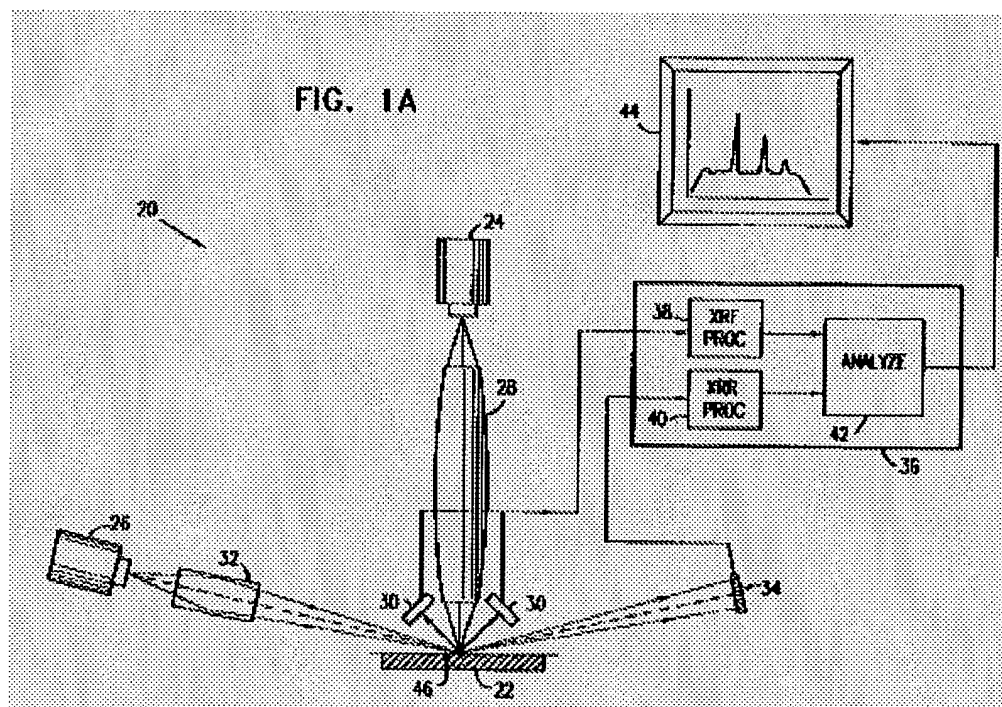
2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

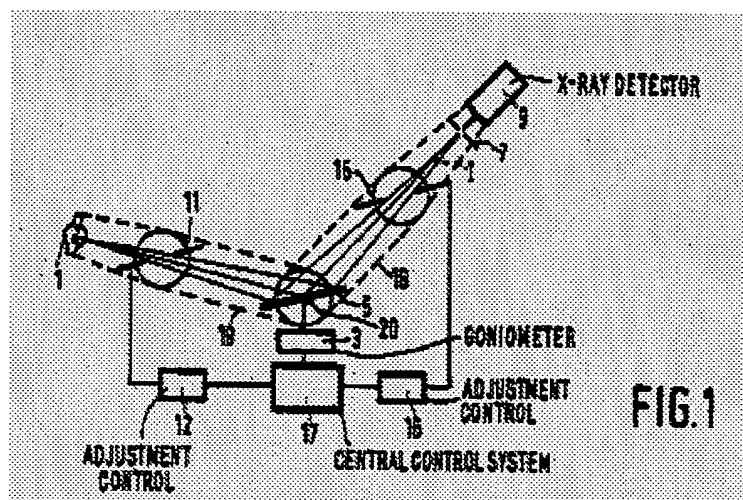
3. Claims 1-4, 8, 10, 12, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vu et al. (US Patent 6,381,303 B1) in view of Van Vlijmen (US Patent 5,268,953).

With respect to claim 1, Vu discloses a measurement system (20) for evaluating characteristics of a sample (22) using an X-ray probe beam, comprising: an X-ray source (26) that generates the X-ray probe beam; an optical system (32) for focusing

the X-ray probe beam onto the surface of the sample (22), such that the x-ray probe beam is reflected off the sample (22); a detector (34) that receives the X-ray probe beam reflected off the sample (22) and generates a plurality of signals in response to receiving the X-ray probe beam; and a processor (36) for analyzing the plurality of signals generated by the detector (34) to evaluate characteristics of the sample (22).



Vu fails to disclose an adjustable X-ray source. Van Vlijmen discloses an adjustable X-ray source (1) and an entrance slit (11) mounted together on an X-ray source arm (Fig.1; Column 3, line 4-16) for angular adjustment of the X-ray source relative to a sample to be analyzed (column 3; lines 3-16).



It would have been obvious to

one ordinary skill in art at the time invention was made provide the measurement system for evaluating characteristics of the sample using the X-ray probe beam of Vu with the angular adjustment of the X-ray source relative to the sample to be analyzed of Van Vlijmen, in order to provide a measurement system for making adjustments to components of the system to improve the operation accuracy.

With respect to claim 2, Vu's system modified with Van Vlijmen disclosing the adjustable X-ray source comprising: an X-ray emission material, a housing (19) that contains the material, where the housing has an adjustable aperture (11) through which the X-ray probe beam is projected toward the sample (column 3; lines 3-16) would allow one of ordinary skill in art to adjust the resolution of the system by adjusting a take-off angle of the X-ray source.

With respect to claims 3, 8 and 12, Vu's system modified with Van Vlijmen disclosing the adjustable X-ray system with adjustment control (12) controllable by a processor (17) to adjust the X-ray emission relative to aperture (11) (column 3; lines 3-

16) would allow one of ordinary skill in art to employ a mechanical or automatic means to adjust the resolution of the system.

With respect to claim 4, Vu's system modified with Van Vlijmen disclosing the adjustable X-ray system with the adjustable aperture (11) for adjusting a take-off angle of the X-ray emission (Fig. 1; column 1; lines 6-12) would allow one of ordinary skill in art to adjust the resolution of the system by adjusting a take-off angle of the X-ray emission.

With respect to claims 10, Vu's system modified with Van Vlijmen disclosing the adjustable X-ray system with adjustment control (12) (column 3; lines 9-13) would allow one of ordinary skill in art to include a manual adjustor to the adjustable source such that an user can manually adjust a characteristic of the X-ray probe, since it has been held that provision of adjustability, where needed, involves only routine skill in art. In re Stevens, 101 USPQ 284 (CCPA 1954).

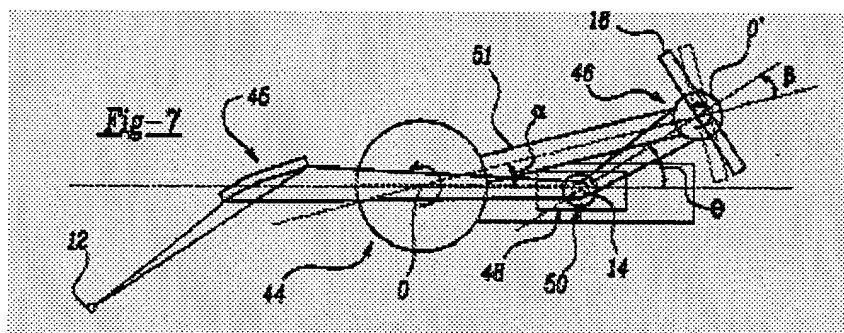
With respect to claims 20 and 21, Vu's method analyzing samples modified with Van Vlijmen's adjustable X-ray system shows generally all that is claimed except disclosing focusing the probe beam onto one of the plurality of different samples. This limitation doesn't change scope of the intention because simultaneously focusing the probe beam onto the different samples and further analyzing outcome is well known optimization problem in the art of the multi array position-sensitive detectors with the processing units.

With respect to claims 22 and 23, Vu's method of analyzing a thin film sample (column 6; line 62 – column 7; line 3) modified with Van Vlijmen's adjustable X-ray

system disclosing focusing the probe beam onto the sample would allow one of ordinary skill in art to adjusting the system resolution based information regarding the thin film sample.

4. Claims 5-7, 9, 11,13, 26, 27 and 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vu et al. (US Patent 6,381,303 B1) in view of Van Vlijmen (US Patent 5,268,953) and in further view of Verman et al. (US Patent 6,069,934).

With respect to claim 5, Vu's system modified with Van Vlijmen's adjustable X-ray system shows generally all that is claimed except disclosing a detector position adjustor for adjusting the position of the detector relative to the sample. Verman discloses an adjustable X-ray system (Figs. 1-7) comprising a detector position adjustor for adjusting the position of a detector (16) relative to a sample (14) to allow adjustment in the resolution any known type X-ray reflector (column 2; lines 45-56).



It would have been obvious

to one ordinary skill in art at the time invention was made to provide the measurement system for evaluating characteristics of a sample using the X-ray probe beam of Vu with the angular adjustment of the X-ray source relative to the sample to be analyzed of Van Vlijmen and further with the adjustor for adjusting the position of a detector relative to a

sample of Verman, in order to provide a measurement system for making adjustments to components of the system to improve the operation accuracy.

With respect to claims 6 and 7, Vu's system in view of Van Vlijmen disclosing the adjustable X-ray system and further modified with Verman fails to disclose adjusting the position of the detector (16) relative to a sample (14) with a carriage, which is engaged with a track. Verman discloses (column 5; lines 1-20) that the detector (16) can be moved to a plurality of positions with a swinging arm (51) and also rotate about itself would provide a measurement system for making adjustments to components of the system to improve the operation accuracy. It would have been obvious to one ordinary skill in art at the time the invention was made to employ Vermans teaching because it appears that invention would perform equally well with the swinging arm.

With respect to claims 7 and 9, Vu's system in view of Van Vlijmen disclosing the adjustable X-ray system and further modified with Verman discloses generally all except a motor coupled to the position adjustor adjusting the position of the detector relative to the sample and processor sending a signal to the motor. It would have been obvious to one ordinary skill in art at the time the invention was made to employ the motor for adjusting the detector, since it has been held that broadly providing a mechanical or automatic means to replace manual activities, which has accomplished the same result, involves only routine skill in the art. In re Venner, 120 USPQ 192.

With respect to claim 11, Vu's system in view of Van Vlijmen disclosing the adjustable X-ray system and further modified with Verman disclosing a manual adjustor coupled to the detector would allow a user manually adjust the detector's position.



With respect to claim 26, Vu's system disclosing a processor for analyzing the characteristics of the sample in view of Van Vlijmen disclosing the adjustable X-ray system and further modified with Verman disclosing an adjustor coupled to the detector would allow one of ordinary skill in art to adjust the resolution of the system to account for characteristics of the sample.

With respect to claims 27 and 29, Vu's method disclosing a processor for analyzing the characteristics of the sample in view of Van Vlijmen disclosing adjusting a take-off angle of the x-ray source and further modified with Verman disclosing an adjustor coupled to the detector would allow one of ordinary skill in art to adjust the resolution of the system by adjusting the take-off angle of the X-ray emission and adjusting the position of the detector relative to the sample.

With respect to claim 28, Vu's method disclosing analyzing the characteristics of the sample in view of Van Vlijmen disclosing the adjustable X-ray system and further modified with Verman disclosing an adjustor coupled to the detector would allow one of ordinary skill in art to adjust the resolution of the system by adjusting the position of the detector relative to the sample.

With respect to claim 30, Vu's system disclosing analyzing the characteristics of the sample with a detector having an array of individual detecting elements oriented to receive X-rays reflected from the sample in order to determine a distribution of reflected X-ray as a function of angle (column 8; lines 1-31) in view of Van Vlijmen disclosing the angular adjustment of the detector and further modified with Verman disclosing an adjustor coupled to the detector would allow one of ordinary skill in art to optimize the

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evaluation of the sample by adjusting the resolution of the system by striking the individual detecting elements on the array.

With respect to claim 31, Vu's system disclosing analyzing the characteristics of the sample in view of Van Vlijmen disclosing the angular adjustment of the detector and further modified with Verman disclosing an adjustor coupled to the detector would allow one of ordinary skill in art to adjust the resolution of the system by controllably changing the position of the detector relative to the sample.

With respect to claim 32, Vu's system disclosing analyzing the characteristics of the sample in view of Van Vlijmen disclosing adjusting a take off-angle of the X-source and further modified with Verman disclosing an adjustor coupled to the detector would allow one of ordinary skill in art to adjust the resolution of the system by adjusting a take off-angle of the X-ray source.

With respect to claim 33, Vu's system disclosing analyzing the characteristics of the sample in view of Van Vlijmen disclosing adjusting an apparent wide of the X-source and further modified with Verman disclosing an adjustor coupled to the detector would allow one of ordinary skill in art to adjust the resolution of the system by adjusting the apparent wide of the X-ray source.

5. Claims 14-19, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vu et al. (US Patent 6,381,303 B1) in view of Verman et al. (US Patent 6,069,934).

With respect to claim 14, Vu discloses an adjustable measurement system for evaluating characteristics of a sample (22) using an x-ray probe beam, comprising: an

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x-ray source (26) that generates the x-ray probe beam; an optical system (32) for focusing the x-ray probe beam onto the surface of the sample (22), such that the x-ray probe beam is reflected off the sample (22); a detector (34) which receives the x-ray probe beam reflected off the sample, and generates a plurality of signals in response to receiving the x-ray probe beam; and a processor (36) for analyzing the plurality of signals generated by the detector to evaluate characteristics of the sample. Vu fails to disclose a detector position adjustor. Verman discloses a detector position adjustor wherein the detector (16) is mounted to the detector position adjustor, and the detector position adjustor can move the detector to a plurality of positions relative to a sample (14) being detected, where the position is determined by characteristics of the sample being evaluated to allow adjustment in the resolution any known type X-ray reflector (column 2; lines 45-56). It would have been obvious to one ordinary skill in art at the time invention was made provide the measurement system for evaluating characteristics of a sample using the X-ray probe beam of Vu with the adjustor for adjusting the position of a detector relative to the sample of Verman, in order to provide a measurement system for making adjustments to components of the system to improve the operation accuracy.

With respect to claims 15 and 17, Vu's system modified with Verman fails to disclose adjusting the position of the detector (16) relative to a sample (14) with a carriage, which is engaged with a track. Verman discloses (column 5; lines 1-20) that the detector (16) can be manually moved to a plurality of positions with a swinging arm (51) and also rotate about itself would provide a measurement system for making

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adjustments to components of the system to improve the operation accuracy. It would have been obvious to one ordinary skill in art at the time the invention was made to employ Verman's teaching because it appears that invention would perform equally well with the swinging arm.

With respect to claims 16, 18 and 19, Vu's system modified with Verman discloses generally all except a motor coupled to the position adjustor adjusting the position of the detector relative to the sample and processor sending a signal to the motor. It would have been obvious to one ordinary skill in art at the time the invention was made to employ the motor for adjusting the detector, since it has been held that broadly providing a mechanical or automatic means to replace manual activities, which has accomplished the same result, involves only routine skill in the art. In re Venner, 120 USPQ 192.

With respect to claims 24 and 25, Vu's method modified with Verman disclosing adjusting the position of the detector relative to the sample would allow one of ordinary skill in art to change the resolution of the system by moving the detector.

### ***Conclusion***


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is (703) 305-6464. The examiner can normally be reached on M-F(8:30-5:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Irakli Kiknadze  
July 11, 2003

  
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